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09/927,009	08/09/2001	Pankaj Vinubhai Shah	A01098A	4173

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Ronald D. Bakule  
Rohm and Haas Company  
100 Independence Mall West  
Philadelphia, PA 19106

EXAMINER

GOFF II, JOHN L

ART UNIT PAPER NUMBER

1733

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 09/927,009  
Filing Date: August 09, 2001  
Appellant(s): SHAH, PANKAJ VINUBHAI

**MAILED**

**JUN 10 2004**

**GROUP 1700**

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Ronald Bakule  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 4/8/04.

**(1) Real Party in Interest**

A statement identifying the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) Status of Claims**

The statement of the status of the claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is incorrect.

The amendment after final rejection filed on 1/20/04 has been entered. Appellant's arguments were addressed in the advisory action mailed 2/24/04.

**(5) Summary of Invention**

The summary of invention contained in the brief is deficient because appellant's explanation of the invention defined in the claims does not refer to the specification. It is noted claims 1-4 are described in the specification in full detail on page 2, line 30 through page 5, line 24.

**(6) Issues**

The appellant's statement of the issues in the brief is correct.

**(7) Grouping of Claims**

The rejection of claims 1-4 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

**(8) Claims Appealed**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) Prior Art of Record**

**(A) Listing of Prior Art of Record**

6,365,700	GRAHAM	4-2002
5,939,499	ANDERSON et al.	8-1999

**(B) Brief description of the Prior Art of Record**

Graham discloses a method for forming a moisture reactive hot melt adhesive. Graham teaches a first step of reacting a polyol (e.g. a polyester polyol) having a molecular weight in the range of 2,000-15,000 and a polyisocyanate in an NCO:OH ratio of 0.7-1.4 to form a hydroxyl-functional prepolymer. Graham teaches a second step of admixing the prepolymer with additional polyol (e.g. crystalline polyester polyol) in amounts of 30-60% prepolymer and 5-70% additional polyol along with additional polyisocyanate in an NCO:OH ratio of 1.2-3. Graham then teaches reacting the admixture to form a moisture reactive hot melt adhesive. Graham teaches the moisture reactive hot melt adhesive is used to bond a variety of substrates.

Anderson et al. show the well know technique for bonding two substrates using moisture reactive hot melt adhesive. Anderson et al. teach applying the adhesive to a first substrate at a temperature of 95 to 175 °C, contacting a second substrate to the applied adhesive, and cooling

the adhesive. Anderson et al. teach the moisture reactive adhesive is cured by moisture in the atmosphere or by adding reactive compounds having free active hydrogens to the bond line.

**(10) *Grounds of Rejection***

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-3 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Graham (U.S. Patent 6,356,700).

Graham discloses a method for forming a moisture reactive hot melt adhesive (Column 1, lines 21-29). Graham teaches a first step of reacting a polyol (e.g. a polyester polyol) having a molecular weight in the range of 2,000-15,000 and a polyisocyanate in an NCO:OH ratio of 0.7-1.4 to form a hydroxyl-functional prepolymer (Column 1, lines 61-67 and Column 2, lines 7-9, 14-16, 37-39, 44-46, and 49-53). Graham teaches a second step of admixing the prepolymer with additional polyol (e.g. crystalline polyester polyol) in amounts of 30-60% prepolymer and 5-70% additional polyol along with additional polyisocyanate in an NCO:OH ratio of 1.2-3 (Column 3, lines 29-34, 38-46, 51-53, and 59-62). Graham then teaches reacting the admixture to form a moisture reactive hot melt adhesive. Graham teaches the moisture reactive hot melt adhesive is used to bond a variety of substrates (Column 1, lines 26-29).

Regarding the limitation of admixing the prepolymer and additional polyol in a 9/1 to 1/9 weight ratio, as noted above Graham teaches admixing the prepolymer with additional polyol in amounts of 30-60% prepolymer and 5-70% additional polyol such that Graham meets the limitation, e.g. 30% prepolymer and 70% additional polyol could be used. Additionally, the examples of Graham show weight ratio of prepolymer to additional polyol within the broad claimed range such that Graham appears directed to using prepolymer to additional polyol ratios

within the broad range claimed by appellant (See Examples 2 and 3). In any event, it would have been obvious to one of ordinary skill in the art at the time the invention was made to admix the prepolymer and additional polyol within the claimed broad range of 10-90% each component in order to provide a useful reactive hot melt in Graham as the ordinary artisan would have been expected to experimentally determine the optimum ratio for a given property and adhesive being manufactured.

Regarding the limitation of the polyol having a molecular weight of 250-5,000, as noted above Graham expressly teaches choosing a polyol having a molecular weight in the range of 2,000-15,000 such that Graham meets the limitation. Furthermore, while Graham does not exclude using molecular weights at the extremes of the range, Graham does note that if the molecular weight is to high or to low efficient mixing can be difficult (Column 2, lines 44-58) such that it would have been obvious to one of ordinary skill in the art at the time the invention was made to experimentally determine the optimum polyol molecular weight as a function of the efficiency of the process as doing so would require nothing more than ordinary skill and routine experimentation.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graham as applied to claims 1-3 above, and further in view of Anderson et al. (U.S. Patent 5,939,499).

Graham as applied above teaches all of the limitations in claim 4 except for a specific teaching of a method for applying the moisture reactive hot melt adhesive. However, as noted above Graham teaches the moisture reactive hot melt adhesive is used to bond a variety of substrates. One of ordinary skill in the art at the time the invention was made would have readily appreciated applying the moisture reactive hot melt adhesive taught by Graham using the general

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technique in the art of applying the adhesive in a hot state to a substrate in the presence of moisture and cooling the adhesive after application of a second substrate as this technique is well known for applying moisture reactive hot melt adhesives as shown for example by Anderson et al.

Anderson et al. show the well know technique for bonding two substrates using a moisture reactive hot melt adhesive. Anderson et al. teach applying the adhesive to a first substrate at a temperature of 95 to 175 °C, contacting a second substrate to the applied adhesive, and cooling the adhesive. Anderson et al. teach the moisture reactive adhesive is cured by moisture in the atmosphere or by adding reactive compounds having free active hydrogens to the bond line (Column 7, lines 41-63).

**(11) Response to Argument**

Regarding the 35 USC 102(e) rejection of claims 1-3, appellant argues,

“The examiner rejected claims 1-3 under 35 USC 102(e) as being anticipated by Graham. The examiner points to certain common elements in Graham but concedes that Graham does not disclose admixing second components including the hydroxyl-functional prepolymer, a crystalline polyester polyol, and a polyisocyanate, the weight ratio of the hydroxyl-functional prepolymer to the polyol being from 9/1 to 1/9.”

The Examiner has not conceded this argument. Rather, the Examiner notes Graham does not specifically characterize the admixing ratio of prepolymer to additional polyol as 9/1 to 1/9. However, Graham discloses “The content of prepolymer is most useful in the range of 30 to 60%” and “The optional second stage hydroxy compounds will be present in amounts of 5 to 70%” (Column 3, lines 45-46 and 61-62). Thus, Graham discloses prepolymer to additional polyol ratios with the claimed **broad** range, e.g. 30% prepolymer and 70% additional polyol, such that the claimed limitation is met.

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Appellant further argues,

“Appellant submits that Graham's disclosure does not provide appellant's invention of claims 1-3 with a sufficient degree of specificity to constitute anticipation under 35 USC 102(e).”

and

“Further, the examiner points to Example 2 of Graham as illustrative of an anticipating weight ratio of hydroxyl-functional polymer to polyol; appellant respectfully points out, however, that the polyol used in the first step of Graham's Example 2, DYNACOLL 7361, is indicated (Graham, column 2, lines 19-21) to have a molecular weight of 7000. Appellant's claims 1-3 recite the polyol of their first components as having a weight average molecular weight of from 250 to 5,000. Appellant submits that Graham's Example 2, therefore, is not an anticipating disclosure nor does the examiner point any other specific disclosure of appellant's molecular weight range or its beneficial combination with appellant's weight ratio of hydroxyl-functional polymer to polyol.”

As noted in the advisory action mailed 2/24/04, the Examiner agrees Example 2 of Graham is not an anticipating disclosure. However, regarding the polyol of the prepolymer Graham discloses “The 7200 molecular weight polymer is the best commercially available polyester although molecular weights in the range of 2000 to 15,000 will work as well” (Column 2, lines 37-39 Emphasis added). Furthermore, regarding the ratio of prepolymer to additional polyol Graham discloses “The content of prepolymer is most useful in the range of 30 to 60%” and “The optional second stage hydroxy compounds will be present in amounts of 5 to 70%” (Column 3, lines 45-46 and 61-62). Appellant's claim 1 requires “said polyol having a weight average molecular weight of from 250 to 5,000”. As shown above, Graham clearly discloses the use of molecular weights within the claimed range such that the claimed limitation is met. Appellant's claim 1 further requires “the weight ratio of said hydroxyl-functional prepolymer to said polyol being from 9/1 to 1/9”. As shown above Graham clearly discloses prepolymer to additional polyol ratios with the claimed broader range, e.g. 30% prepolymer and 70% additional polyol such that the claimed limitation is met.



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Regarding the 35 USC 103(a) rejection of claims 1-3, appellant argues,

“The examiner rejected claims 1-3 under 35 USC 103(a) as being obvious over Graham. Appellant traverses because the examiner has not meet his burden of providing a prima facie case of obviousness by pointing out any teaching or suggestion within Graham to modify Graham's method or composition to that of appellant. The examiner points to certain common elements in Graham but concedes that Graham does not disclose admixing second components including the hydroxyl-functional prepolymer, a crystalline polyester polyol, and a polyisocyanate, the weight ratio of the hydroxyl-functional prepolymer to the polyol being from 9/1 to 1/9. Neither does Graham teach or suggest changing the ratio of prepolymer to second component polyol at all and particularly not to the range of ratios claimed by appellant.”

As noted above, the Examiner does not concede this argument. Also, the Examiner has not suggested any modification to Graham to change the ratio of prepolymer to additional polyol outside of the ranges taught by Graham. The Examiner has noted Graham discloses “The content of prepolymer is most useful in the range of 30 to 60%” and “The optional second stage hydroxy compounds will be present in amounts of 5 to 70%”. Graham does not disclose any particular/preferred prepolymer to additional polyol ratio such that experimentation to form a useful reactive hot melt would have been obvious and expected of the ordinary artisan. This is the only modification suggested by the Examiner. Furthermore, appellant's range is very broad in that the admixture may contain from 10-90% of each component such that experimentation/determination of the ratio using the ranges suggested by Graham would result in the claimed ratio.

Appellant further argues,

“Further, claims 1-3 recite the polyol of the first components as having a weight average molecular weight of from 250 to 5,000. Graham discloses molecular weights in the range of 2000 to 15,000 with the best commercially available polyester having a molecular weight of 7,200, but states that “if a lower molecular weight hydroxyl terminated polyester is used, i.e., one with a molecular weight of 3600 ... the viscosity of the resulting prepolymer is too high for efficient mixing...” (Graham, page 4, lines 19-22). Graham therefore points out the inapplicability of a first component polyol molecular weight of 3600 to Graham's own method

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and further fails to provide enablement of such a molecular weight in his process, thereby teaching away from the lower molecular weights claimed by appellant.”

While Graham does teach that polyol molecular weights that are to high or to low are not efficient for mixing, **Graham does not exclude their use and Graham is enabled for their use in that mixing of a prepolymer with these molecular weights is not prevented.** In fact, Graham expressly teaches choosing a polyol having a molecular weight in the range of 2,000-15,000. It is also noted that while Graham suggests that a molecular weight of 3600 is to low for efficient mixing, **Graham does not suggest the same of molecular weights from 3,601-5,000.**

Appellant further argues,

“The examiner further suggests that Graham points toward optimum molecular weights including at least 3,601 to 5,000. There is no support for this supposition within Graham; the inapplicability of a molecular weight of 3,600 falls far short of suggesting that 3,601 would be efficacious - there is no such suggestion within Graham- and Graham's comment that the polyester molecular weight can be too high falls far short of suggesting 5,000 as a possible upper limit, particularly since Graham indicates, as above, that a polyester of molecular weight 7,200 is the best commercially available polyol, and that a molecular weight of 15,000 “will work as well”. Appellant respectfully submits that the examiner is relying on appellant's own disclosure and thereby reading absent numerical limitations into Graham.”

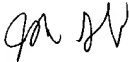
The Examiner has not suggested Graham teaches an optimum molecular weight range having a lower limit of 3,601 and an upper limit of 5,000. However, the Examiner notes Graham discloses polyol molecular weights of the prepolymer in the range of 2,000-15,000. Graham does not exclude the use of a molecular weight of 2,000, and as noted by appellant that a molecular weight of 15,000 “will work as well”, **it is noted Graham discloses the same regarding a molecular weight of 2,000 “will work as well”.** Further, Graham teaches a molecular weight of 3,600 results in inefficient mixing of the prepolymer as does a high molecular weight. Thus, Graham does not exclude a molecular weight of 3,600 or a high molecular weight rather Graham suggests using an optimum molecular weight within the middle

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of the range of 2,000-15,000, and it would have been obvious to one of ordinary skill in the art to experimentally determine/optimize the molecular weight of the polyol from this middle range, a range of molecular weights that would have included 3,601-5,000.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

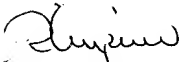


John L. Goff  
June 9, 2004



JEFF H. AFTERGUT  
PRIMARY EXAMINER  
GROUP 1300

Conferees



Richard Crispino



Steve Griffin



Jeff Aftergut

Ronald D. Bakule  
Rohm and Haas Company  
100 Independence Mall West  
Philadelphia, PA 19106